

that it is being continually developed *de novo* by surrounding circumstances. Is this not a sufficient stimulus for increased sanitary legislation?

THE Governor of Minnesota has called on the general Government for aid, as, owing to the ravages of grasshoppers for two years past, many thousands are suffering for want of food. The American naturalists suggest that the grasshopper should be eaten, just as it is in portions of Africa and Western Asia.

The new Minister of Public Instruction visited the Observatory of Paris last week, and expressed his satisfaction to M. Leverrier with what he had seen and with the explanations which had been given to him.

THE ownership of the grounds between the old Paris Observatory Gardens and the Boulevard Arago, more than two acres, has been disputed between the Government and the city of Paris. The right of the city was acknowledged, but the Municipal Council have let it to the Observatory for the nominal rent of 20 francs a year. On these grounds a magnetic service is to be established.

TWO interesting balloon ascents have taken place in America lately, one at New York by Prof. Donaldson, with his large Transatlantic balloon, and a batch of reporters from several influential papers at New York. The trip, including four landings, lasted more than twenty-four hours, and ended in the vicinity of Saratoga, the balloon having run a distance of about eighty miles. A few days afterwards Prof. Wyse executed an ascent in Canada, in order to ascertain if a western current blows in the upper parts of the atmosphere when the lower stream of air is running in another direction. At a moderate height the western current was met with. Prof. Donaldson contends that it is a consequence of the revolution of the earth, and can be trusted to for crossing the Atlantic from America to Europe. But can these partial experiments be really relied upon? That remains to be demonstrated.

ONE of the very few scientific members of the Versailles Assembly has departed. M. Fland, an engineer, died at Dinan, where he was appointed Mayor seventeen years ago. He had an engine manufactory at Brest, and was appointed by contract the constructor of the celebrated Giffard injector. M. Fland was originally a pupil of the Ecole des Arts et Métiers d'Angers.

MR. THOMAS MUIR, M.A., F.R.S.E., Assistant Professor of Mathematics in the University of Glasgow, and author of some original investigations in Mathematics, has been appointed successor to Dr. Bryce in the Mathematical Mastership of the High School of Glasgow.

MR. CHARLES MOORE, the *Garden* states, who recently brought a good many valuable and very novel plants to this country from the South Sea Islands and Australia, returns to Sydney by the next mail, having visited many of the best botanic gardens and nurseries in Europe, and selected an immense collection of valuable and rare plants for the Sydney Botanic Garden, which is said to be one of the most beautiful in the world.

WE learn from *Iron* that the Academy of Sciences of Berlin offers a prize of 200 dols., payable in July 1876, for the best essay recording experiments as to whether changes in the hardness and friability of steel are due to chemical or physical causes, or to both. Papers in German, Latin, English, or French, are to be sent in before March 1876.

THE Report of the Council of the Leicester Literary and Philosophical Society, presented at the annual meeting of June 15 last, is on the whole very gratifying. The Society contains a large number of members, and is working in the right direction in trying to interest not only the members, but the inhabitants of Leicester generally, in science as well as literature. During last

winter a very judiciously planned course of lectures was delivered in connection with the Society, which was fairly attended, and would, we believe, have been still better attended, had there been no free seats. The Society is divided into sections, three of which are scientific—(1) Meteorology and General Physics, (2) Geology and Palaeontology, (3) Natural History. Satisfactory reports are given in Nos. 1 and '3, the latter having set itself to the collection of statistics of the natural history of the county, and the former, among other things, to a regular series of meteorological observations. We hope the Leicester Society will persevere in its work.

WE have received as No. 1 of the "Proceedings of the Chester Society of Natural Science," a very excellent list (with remarks) of birds observed in Werral, Cheshire, by J. F. Brockholes. The list contains 168 species.

THE Seventh Annual Report of the Trustees of the Peabody Museum of American Archæology and Ethnology (Harvard) contains some account of the valuable series of objects connected with South American and Pacific archæology and ethnology, which the late Prof. Agassiz acquired during his voyage in the *Hassler* in 1871-2, and which have been transferred to the Peabody Museum. The collection is very valuable and comprehensive; there are 330 specimens of Peruvian skulls alone. The Report contains a very ingenious paper, apparently by Mr. J. Wyman, the Curator, On the human remains in the shell heaps of the St. John's River, East Florida, in which the author argues, from the condition of the bones and other circumstances, that the Floridan aborigines were in all probability cannibals.

ONE of the many valuable results of the work of the U.S. Geological Survey of the Territories, is a "Synopsis of the Flora of Colorado," by T. C. Porter and J. M. Coulter. This work is intended to be a type of a series of handbooks of different branches of natural history, to be published from time to time as a part of a series of "Miscellaneous Publications" for the use of students. No. 3 of the series is nearly ready, and has been prepared by the eminent ornithologist, Dr. E. Coues. It will form an octavo volume of several hundred pages, bringing the whole subject of western ornithology up to date.

A PAPER by Dr. H. D. Schmidt, of New Orleans, U.S.A., On the construction of the dark or double-bordered nerve-fibre, occupies a large part of the last number of the *Microscopic Journal*, and is illustrated by three plates. In the same number is the first instalment of a communication by Rev. S. J. Brakey on the theory of immersion.

THE additions to the Zoological Society's Gardens during the past week include two Chukar Partridges (*Cacabis chukar*) from N. W. India, presented by the Hon. Justice Jackson; four Sandwich Terns (*Sterna cantianca*), four Avocets (*Recurvirostra avocetta*), European, purchased; a Common Crowned Pigeon (*Goura coronata*), two Bronze-winged Pigeons (*Phaps chalcoptera*), hatched in the Gardens; a Black-eared Marmoset (*Hapale penicillata*) from Brazil; and two Suricates (*Suricata senik*) from South America, deposited.

#### FRENCH ASSOCIATION FOR THE PROGRESS OF SCIENCE

THE Lille Session was opened on Aug. 20 by the address of M. Wurtz, of which you have received a copy, and which has been published in all the French papers. The *Débats*, by an extraordinary access of zeal, published it a day before it was delivered!

On Friday Colonel Laussedat read at a general session a report on the results of the last session.

On Saturday evening a lecture on the Transit of Venus was delivered by M. Faye, before a very large audience at the Cercle du Nord, a magnificent building, richly fitted up. The accomplished astronomer referred mostly to the arrangements at the French stations, deeply regretting that all civilised nations had not been united into a kind of federation for working in combination at a problem of such magnitude; he hopes that it will be so in 1882. He insisted upon the importance of photography, which has been used to such good purpose by the Americans, and he trusts that in future times photography will take the lead in such observations. He gave interesting details as to the Yokohama station, to which a Japanese prince educated in France will be attached as a photographer. The consequence will be that M. Janssen and his associates will be admitted into the interior sea of Japan, where, up to the present moment, not a single foreign vessel has ever sailed.

Owing to the coincidence of the meeting of the British Association at Belfast, scarcely any English savants are present here. The only British member I have seen up to the present moment is Dr. Sylvester, the celebrated mathematician. He has been nominated the honorary president of his section, the acting president being M. Catalan, who, though a Frenchman, is regarded as a representative of Belgium. Ten years ago he settled in Liège, where he is a professor in the University.

The interest felt by the people generally is not nearly so great as in the case of the British Association in England. The inhabitants of the city do not appear to understand fully the extent of the honour conferred on them. A *train de plaisir* has been organised to visit distant workshops, but Lille workshops have not been opened for inspection.

Newspapers are glad to publish the transactions of the several sections, but the Association has not authorised any one of them to publish them at full length.

Last Saturday a most interesting experiment was tried with success on the Northern line. M. Giffard, the inventor of the injector, has constructed a new waggon which is suspended by powerful springs at both extremities, thus completely avoiding oscillation. It is very easy to read and even to write in these new carriages. The invention will be exhibited very shortly to the English public.

W. DE FONVIELLE

Lille, Aug. 23

# OPENING ADDRESS BY THE PRESIDENT, M. WURTZ, AT THE MEETING OF THE FRENCH ASSOCIATION

## *The Theory of Atoms in the General Conception of the Universe*

FRANCIS BACON conceived the idea of a society of men devoted to the culture of science. In his "New Atlantis," in which he describes the organisation of this society and its influence upon the destinies of a wisely governed people, he shows it rising to the dignity of a State institution. The progress of civilisation by the search for truth, and truth discovered in the order of nature by experiment and observation—such are the ends proposed and the means made use of. Thus, in an age when the syllogism was still supreme, and which was firmly held beneath the scholastic yoke, the English Chancellor assigned to science at once its true method and its mission in the world.

The plan of Bacon embraced all branches of human knowledge. The land was overrun by a multitude of observers, engaged, some in studying the monuments of the past, the language, the manners, the history of the nations; others in observing the configuration and the productions of the soil, noting the superficial structure of the globe and the traces of its revolutions, collecting all the data concerning nature, the organisation and distribution of plants and animals. Other men, located in various regions, cultivated the exact sciences. Towers were constructed for the observation of stars and meteors; vast edifices, arranged for the study of physical and mechanical laws,

contained machines which supplied the deficiency of our forces, and instruments which added to the precision of the senses and rendered abstract demonstrations sensible. This immense labour was uninterrupted, co-ordinated, controlled; it had its origin in self-abnegation, it was regulated by precision, and had time for its sanction. Thus was it fruitful.

Such was the idea of Francis Bacon. To observe all things; by the rational comparison of these observations to disclose the hidden connections of phenomena, and to rise by induction to the discovery of their real nature and their causes, all with the view "of extending the empire of man over entire nature, and of executing everything possible for him to do;" such is the object which he has pointed out to us; such is the function of science.

This great exploration of the earth which he desired to institute, this patient and exact research of the laws of the universe, this deliberate intervention of science in the affairs of life and of the universe,—could all this be the work of his own time? He knew it too well to venture to hope it himself, and it is on this account, doubtless, that he placed the fortunate country which enjoyed so noble an institution in the solitude of the great ocean.

Two centuries and a half ago the conception of Bacon was regarded as a noble utopia; to-day it is a reality. That magnificent programme which he then drew out, is ours, gentlemen; ours, not in the narrow sense of the word, for I extend this programme to all who, in modern times and in all countries, give themselves to the search for truth, to all workers in science, humble or great, obscure or famous, who form in reality, in all parts of the globe and without distinction of nationality, that vast association which was the dream of Francis Bacon. Yes, science is now a neutral field, a commonwealth, placed in a serene region, far above the political arena, inaccessible, I wish I could say, to the strifes of parties and of peoples; in a word, this property is the patrimony of humanity. It is, too, the principal conquest of this century, which my illustrious predecessor characterised, with so much justice, as the century of science.

Modern generations are spectators, indeed, of a magnificent spectacle. For a century past the human mind has directed an immense effort to the study of the phenomena and the laws of the physical universe. Hence an astonishing development of all the sciences founded on observation and experiment. New ideas which have arisen in our days in the correlation and conservation of forces have been like a revelation to some of these sciences. Mechanics, physics, chemistry, physiology itself, have found at once a *point d'appui* and a bond of connection. And this powerful flight of ideas has been sustained by the progress of the methods, I should say by the more careful exactness of observations, the perfect delicacy of experiments, the more rigorous severity of deductions. These are the springs of this movement which hurry along the sciences, and of which we are the astonished and moved witnesses. It is to propagate it broadcast over our country that we hold, each year, this parliament, to which are invited all who take part or are interested in the war against the unknown. Science is indeed a war against the unknown; for, if in literature it is enough to give expression, and in art a body, to conceptions or beauties deposited either in the human mind or in nature, it is not so in science, where truth is deeply hidden. She must be conquered, she must be stolen, like the Promethean fire.

It is of some of these conquests that I wish to speak to-day, full of doubt and apprehension in presence of so great a task. To respond to the demands of his position and to follow noble examples, your president ought, at the beginning of this session and of the ceremonies which inaugurate our young association, to trace the progress accomplished in the sciences, mark by a few bold lines the various routes over which it has recently run, and the culminating points which it has attained. I shrink from such a programme: if it does not exceed the powers of some of my colleagues, and doubtless of some among you, it greatly surpasses mine. Less justified and less daring than was Condorcet at the end of last century, I only perceive the outlines and some bright patches of the sketch which he attempted to draw; and to see it accomplished, I shall call to my assistance those who will follow me in the honourable and perilous post I now occupy.

I shall confine myself, then, gentlemen, to speaking to you of what I know, or of what I think I know, by directing your attention to the science to which I have devoted my life.

Chemistry has not merely grown, it has been regenerated since Lavoisier. You know the work of that immortal master. His labours in connection with combustion gave to our science an immovable basis by fixing at once the notion of simple bodies